

China's Evolving Energy Markets

Market & Sector Transformation in China

DEAN GIRDIS of PFC Energy's Gas & Power unit assesses the transformations under way in China's energy market and the likely impact on the Asia energy sector.

CHINA'S ENERGY MARKETS continue to transform through the mechanisms of government sector reform and restructuring, expanding investment by domestic and foreign energy companies, and the resulting transition toward competitive markets. The Chinese government continues to push through reform and industry restructuring measures in order to encourage the necessary investment needed to meet energy demand growth. Such measures are seen as critical, by both the government and market players, to achieving a manageable energy balance - one that will be more consistent with China's overall economic objectives - by increasing energy supply, encouraging investment and by improving sector efficiency, increasing transparency, and introducing more competition, and ultimately, to reducing the cost of energy to the consumer.

There are several issues that are intertwined with, and dominant, in China's Energy markets, which are in turn impacting on government policy and market and competitive responses. These include:

- Security of supply - China's growing oil and gas supply gap.
- Ongoing natural gas sector development.
- Restructuring and privatisation of the state's power assets.
- Government Policy - Ongoing sector reform and transparency.

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Collectively, these issues could have a significant impact on Asian energy markets in terms of supply, geopolitics and long-term pricing.

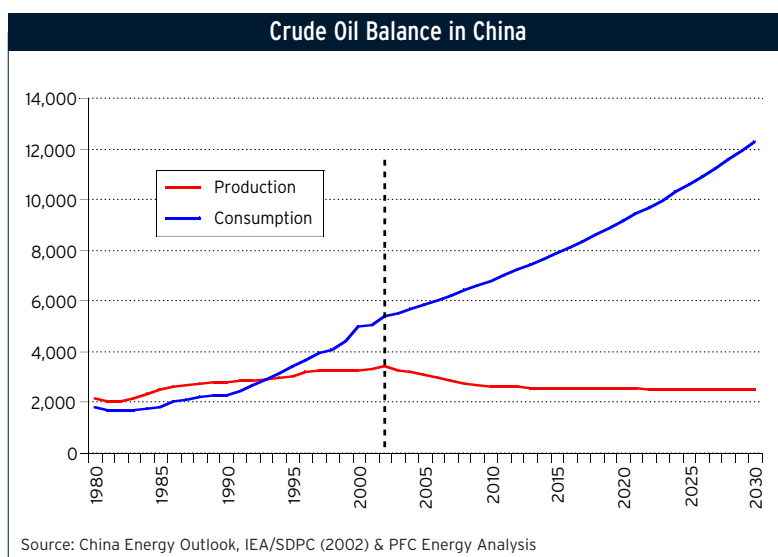
Security of Supply - China's Growing Oil & Gas Supply Gap

China continues to focus on the development of domestic oil and gas resources throughout the country. Increased oil exploration and development activity is moving west and will focus on the Tarim, Junggar, and Tu-Ha Basins. On the gas side, the Tarim basin is the primary target of government and foreign operators, including Shell and ExxonMobil,

to fill the West-East pipeline. In the East China Sea, CNOOC (China National Offshore Oil Company) and the Chinese government have high hopes of a major find. However, a combination of unattractive exploration terms and China's (thus far) unimpressive geology is unlikely to produce substantial additions to oil reserves though additional finds of gas are more likely. At the same time, currently producing oil fields have been on the decline for over a decade. As a result domestic supply of oil and gas will be insufficient to meet demand forecasts. As noted in the Chart above, China became a net importer of crude oil in 1996 and imports are expected to rise from 1.7 mb/d in 2001 to 4.2 mb/d in 2010 and 9.8 mb/d in 2030.

Thus, there will be increasing reliance on imported oil and gas moving forward. Oil and petroleum product imports first began in the mid-1990s and the supply gap will grow as the demand for transportation fuels grows. According to the recent joint EIA/Energy Research Institute, State Development and Planning Commission (SDPC) publication on China energy demand, net oil imports by 2010 could reach as much as 4m barrels per day. The picture could be similar for gas given government plans to promote gas for power generation and city distribution. Even if substantial reserves are secured, LNG imports to coastal provinces and piped gas from Russia to northern China will be required.

The Chinese government is well aware of these issues and for some time has promoted investment in overseas oil and gas assets by the state energy companies - Sinopec, CNPC (China National Petroleum Company)/PetroChina, and





CNOOC. Although this response has some logic to it, energy security is much more complex than acquiring access to overseas oil and gas reserves – a myriad of issues are involved including geopolitics, strategic reserves, access to markets and multiply supply options. The reality is that China will have a continuing reliance on foreign sources of oil and gas that has raised government concerns over the country's growing energy insecurity.

As Japan did in the 1970s and 1980s, China is now experiencing a growing reliance on Middle East sources of crude oil. It may be difficult for China in the near term to break this relationship since most available crude supplies are from the Middle East. Almost concurrently, China has sought to strengthen its ties to the Middle East, through discussions/investments with both Iran and Iraq, and to diversify them, via building relationships in other regions of the world. It is unlikely China will be able to reduce this dependency on foreign oil. And it is this fact that raises fears in Beijing that China will compete with the US for international energy (oil) supplies – thus, indirectly tying China's economic growth to US geopolitical positioning and the recent pro-active use of the US military.

Natural Gas Sector Development: A Priority for Investment

Despite the current extended period of relatively moderate economic growth (by China's standards), the gas sector continues to be a focal point of activities by the government and investments by both Chinese and international companies. At present, natural gas plays a very small role in China's energy consuming economy with annual demand of about 30 bcm, equating to 3% of total energy consumption. However, most forecasts indicate that China's total gas demand will grow to over 70 bcm by the end of the decade – a 250% growth in demand.

To achieve this objective, the Chinese government is continuing in its efforts to create a more transparent gas environment to encourage investment via creation of a gas law and appropriate downstream gas regulations. And progress is being made. Concurrent, added incentives have been given to encourage exploration in the Tarim Basin as well as allowing majority foreign shareholdings in gas distribution companies.

China has aggressively pursued the development of the West-to-East pipeline (WEP) – moving ahead faster than many had expected – with construction now underway of the first phase from Jingbiang to Shanghai. The WEP will serve as the catalyst for China's push to increase gas consumption though there are a number of obstacles including upstream reserves of only 16 tcf, downstream market development, project economics, gas transmission and end-user prices, and the enforceability of contracts. Demand concerns are

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warranted when considering the Shaanxi-to-Beijing gas pipeline, which began operating in 1997, and by 2001 had utilised only 63% of its 1.6 bcfpa capacity. Its capacity is now fully utilised and a second line is being considered.

LNG developments in China are moving ahead with the planned LNG re-gasification facilities in Guangdong (2005) and Fujian (2007) and more terminals are likely to be developed in coastal areas up towards Shanghai and even beyond. The critical turning point in the development of each terminal, beyond SDPC approval, was the signing of long-term import contracts with respective offshore liquefaction partners in 2002. And an essential component to these contracts is the inclusion of CNOOC as an equity participant in

the liquefaction terminals and its potential rights to upstream development.

Last, given demand growth projections in China and the supply limitations of WEP, offshore East China Sea and LNG, additional gas supplies will be needed particularly in Northern China. The most likely, if not only, source would be piped gas imports from the Kovytko and Chandravoshye fields in Eastern Siberia though it is possible a pipeline or LNG from Sakhalin could be developed.

Given the scope of activities now underway in China, such as the ongoing regulatory work, pipeline development and LNG investment, gas will play a growing role in several ways. First, it will meet some of China's growing energy demand and in the process help improve air quality in higher income and rapidly growing Eastern provinces through conversion of existing coal fired boilers and displacement of coal power plants. But more importantly, it is helping to shape government policy by moving reform along, as well as by influencing China's geopolitical positioning in Asia.

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In terms of the gas development, the government (via the old State Council Office for Restructuring Economic System) has continued development of downstream gas regulations and the creation of a gas law. These are seen as critical complements to the existing upstream regulations and as a necessary prerequisite to encourage the planned gas sector development in the country.

Privatisation of the State's Power Assets - and Needed Next Steps

Twenty years of power sector development is coming to an important juncture in the privatisation of state power assets. This is the culmination of economic reform measures that have rapidly developed the power sector. Since 1980, the government has introduced a number of measures to promote investment including the introduction of surcharges on consumption to finance projects, increased access to provincial and local government funds, creation of independent domestic companies and use of foreign partners. Substantial additional investment will be required given power demand growth projections - and much of this growth will be dominated by coal fired power plants, though nuclear and gas power plants will play a larger role.

The ongoing privatisation of the State Power Corporation is aimed at introducing and promoting competitive power markets through the separation of generation from transmission and the introduction of bidding systems whereby generators will compete economically for access to the grid. Five electricity generation companies will be formed each with no more than 20% of the Chinese power market as well as two power grid operators who will purchase power on a competitive basis from the newly established generators.

The Chinese government rightly sees the privatisation as an important step in promoting needed sector investment. Additionally, these changes seek to break monopoly power,

introduce competition, reduce cost, develop more appropriate pricing mechanisms, promote interconnection of the national grid, and ideally, promote the creation of a transparent market system.

Regarding the power sector, the government still needs to pursue needed policy changes and reform generation, transmission and retail power tariff mechanisms to eliminate market distortions - a clear and transparent regulatory framework is a condition of such changes. In a move towards achieving this, the government has created a new power regulatory agency, the State Power Regulatory Commission. The expectations are that this agency will be addressing the issues noted above to ensure that competitive power markets are allowed to develop. The political regime is following through on earlier plans and is in fact accelerating them.

Government Energy Policy - Where is it Going?

China has announced the formation of a new Energy Bureau that will be set up under the newly restructured SDPC, now named the State Development and Reform Commission (SDRC). While details are still sketchy, it appears that the new Bureau will consolidate many of the energy policy responsibilities that had previously been divided among parts of three major bureaucracies: the SDPC, which was the predecessor to the current SDRC, and the State Economic and Trade Commission (SETC) and the Ministry of Foreign Trade and Economic Cooperation (MOFTEC), which were merged to form the new Ministry of Commerce, this past March.

China has not had a formal energy ministry since the early 1990s. With all of the changes in energy policy that have been effected under the interim fragmented energy bureaucracy, some will wonder why the government now feels the need to consolidate. The answer is probably that while there have been a lot of changes in energy policy, there is still a lot that needs to be done in terms of planning and coordination, with respect to both primary sources and electricity. The energy industry is reforming, but the introduction of greater synergies amongst the oil/gas, coal, power and hydro sub-sectors will ideally increase efficiency of investment overall - particularly in the context of improving the overall efficiency of the power sector. It is likely that the key issues of the new Energy Bureau will focus on is improving overall security of energy supply, as noted above, and as a means of achieving this, the development of a strategic petroleum reserve.

The implications for international oil and gas companies seeking investment opportunities in China will likely be enhanced by the creation of the Energy Bureau as long as it introduces greater consistency and transparency in decision making. The SDRC and its predecessor organisations have always been involved in major energy investments, and to the extent that the basis for this involvement will not be more concentrated, the process will likely be more coherent and less subject to arbitrary changes and delays.

There are however some risks inherent in the creation of any new government organisation, namely that the new Bureau will make the wrong decisions, or that it will interfere with other key energy institutions, such as the National Oil Companies - or that it will make no decisions at all. Given the issues facing China and the location of the new Bureau with-

in the strategically important SDRC, it is at least possible that these downside risks can be avoided and that China may find itself in a stronger position to address the energy challenges that lie ahead.

Impact on Asian Energy Markets

The evolving, liberalising and growing energy markets of China could potentially have a strong influence on Asian energy markets in two ways. First, by increasing competition amongst consuming countries in the region and second, amongst suppliers competing to supply China - especially as China proceeds toward full implementation of its agreements under the World Trade Organisation.

Examining the first statement, increased competition for access to Asian oil and gas could develop over the next decade with major energy consumers, such as Japan and Korea. Although the level of competition could translate into cooperative agreements and joint investments, China is already beginning to position itself for access to Russia's Far Eastern oil and gas reserves. Yukos and CNPC have just signed an agreement to build Russian oil export pipeline from Angarsk to the Chinese city of Daqing for as much as 200 million barrels annually. This was accomplished despite strong lobbying by Japan for a new pipeline to the Russian port of Nakhodka - ultimately to supply Japan.

Access to and competition to supply oil products in the Asia Pacific region will also see the effects of China's increasing requirements for product imports with Singapore

and Korea being the likely beneficiaries. Key considerations here will include ongoing changes in product specifications.

Regarding gas, Japan and China are beginning to compete for access to Sahaklin gas via either LNG or pipeline routes. China's LNG market will likely stimulate the Asian LNG producers who have an advantage over Middle East sources - e.g., the Tangguh development is now underway after several years of delay. However, competition for LNG is also likely to increase in Northeast Asia. This past winter Japan and Korea competed to secure additional LNG supplies to address nuclear shutdowns and a cold winter. The inclusion of multiple LNG regasification terminals in China - and a corresponding growth in gas demand - could further increase competition for LNG supply, though this will depend on available liquefaction capacity.

Ultimately, the development of transparent and competitive Chinese energy markets should have a positive impact on the region as more investment flows to the area - though geopolitical relationships will increasingly play an important in securing access and supply ■

DEAN GIRDIS is a Director in PFC Energy's Gas & Power unit. He specialises in gas and power development, gas and power market reform, regulation and energy portfolio analysis. Dean has 15 years of management consulting experience, principally in the energy sector.

The Petroleum Finance Company
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